CLAIMS

1. A method for manufacturing a magnetic tape, comprising

providing a spool of magnetic tape,

unwinding the spool to pass at least a portion of the magnetic tape through a work area,

marking said portion of the magnetic tape as said tape passes through the work area to form an optically detectable servo pattern thereon.

2. A method according to claim 1, wherein marking said portion of the magnetic tape, includes forming a plurality of tracks on said portion of the magnetic tape.

3. A method according to claim 1, wherein marking said portion of the magnetic tape includes forming a plurality of discrete longitudinally spaced marks.

4. A method according to claim 1, wherein marking said portion of magnetic tape, includes forming multiple bands on said portion of the magnetic tape, each band comprising a plurality of tracks.

5. A method according to claim 1, wherein marking said portion of magnetic tape includes controlling a characteristic representative of a profile of said servo pattern.

6. A method according to claim 1, wherein marking said portion of magnetic tape includes exposing said portion of magnetic tape to a source of radiation for forming said servo pattern.

7. A method according to claim 6, wherein exposing said portion of magnetic tape to a source of radiation includes directing a laser on to said portion of magnetic tape.

8. A method according to claim 6, wherein exposing said portion of magnetic tape to a source of radiation includes pulsing a laser to provide an intermittent source of radiation and thereby forming said servo pattern in discrete sections.

9. A method according to claim 6, wherein exposing said portion of magnetic tape to a source of radiation includes forming a laser beam into a pattern of spots and directing the pattern on to the magnetic tape.

10. A method according to claim 6, including the further act of disposing a flat surface adjacent the section of tape passing through the work area to stabilize the tape by reducing transverse motion of the tape.

11. A method according to claim 6, further including

controlling a characteristic representative of the intensity of exposure to thereby control the profile of the servo pattern formed on the section of magnetic tape and reduce print through.

12. A method according to claim 1, including the act of

cleaning the magnetic tape subsequent to marking a servo track on the magnetic tape.

13. A method according to claim 12, wherein cleaning the magnetic tape includes the act of flowing a gas across the surface of the tape to remove debris from the tape.

14. A method according to claim 12, wherein cleaning the magnetic tape includes the act of contacting the magnetic tape with a cleaning material for removing debris from therefrom.

15. A method according to claim 1, including the step of verifying a characteristic of the servo track for controlling quality of the servo track marked on the magnetic tape.

16. A method according to claim 15, wherein verifying a characteristic includes measuring a characteristic representative of size of the servo track.

17. A characteristic according to claim 15, wherein verifying a characteristic includes measuring a characteristic representative of location of the servo track.

18. A method according to claim 1, wherein marking said portion of magnetic tape includes applying an embossing roller to the tape to form the servo pattern thereon.

19. A method according to claim 1, wherein marking said portion of magnetic tape includes printing the servo pattern on the tape.

20. A method according to claim 1, wherein marking said portion of magnetic tape includes projecting an ink jet onto the tape for printing the servo pattern thereon.

21. A method according to claim 1, wherein marking said portion of magnetic tape includes metallizing the tape to form the servo pattern thereon.

22. A method according to claim l, that includes employing a photographic process to develop an image representative of the servo track pattern.

23. A method according to claim 1, wherein marking the tape includes applying a fluorescent material to the magnetic tape.

24. A method according to claim 1, including the further act of burnishing the magnetic tape.

25. A system for manufacturing magnetic tape having an optically detectable servo track, comprising

a reel assembly for passing said magnetic tape through a work area, and

a marking mechanism for forming an optically detectable mark on a side of said magnetic tape as said tape passes through said work area to form the optically detectable servo track thereon.

26. A system according to claim 25, wherein said marking mechanism includes a laser for forming the servo track by engraving marks on the side of the magnetic tape.

27. A system according to claim 26, including a stabilizer having a flat surface disposed adjacent said magnetic tape and capable of attracting the magnetic tape as the magnetic tape passes over the surface, thereby reducing flutter of the passing tape during marking by said laser.

28. A system according to claim 27, wherein said flat surface comprises a ceramic material.

29. A system according to claim 27, wherein said stabilizer includes a mechanical stop disposed on the flat surface for interfering with lateral movement of the passing magnetic tape, thereby reducing lateral movement during marking by said laser.

30. A system according to claim 25, further comprising a cleaner for removing debris from said tape as said tape passes through said work area, thereby preventing particulate debris from fouling the magnetic tape.

31. A system according to claim 30, wherein said cleaner includes an air source providing a flow of gas across a surface of said magnetic tape, for carrying debris away from the tape.

32. A system according to claim 30, wherein said cleaner includes a tape cleaner in contact with a surface of said magnetic tape for removing debris therefrom.

33. A system according to claim 25, further comprising a burnisher for burnishing said magnetic tape.

34. The system according to claim 25, further including a verification sensor capable of detecting said servo track and of measuring a characteristic of said servo track, said characteristic being representative of successful recording of said servo track on to said magnetic tape.

35. A system according to claim 34, wherein said verification sensor includes an edge detector for detecting an edge of the magnetic tape.

36. A system according to claim 34, wherein said verification sensor includes an optical sensor for detecting an optically detectable characteristic of said servo track.

37. A system according to claim 34, wherein said verification sensor includes an optical sensor for detecting an optically detectable characteristic representative of the presence of the mark on said magnetic tape.

38. A system according to claim 34, wherein said verification sensor includes means for detecting an optically detectable characteristic representative of the size of the mark on said magnetic tape.

39. A system according to claim 34, wherein said verification system includes means for detecting an optically detectable characteristic representative of the location of a mark on said magnetic tape.

40. A system according to claim 34, wherein said verification system includes control means for controlling the marking mechanism, in response to said characteristic representative of successful recording of the servo track on the magnetic tape.

41. A system according to claim 26, wherein said marking mechanism includes a laser.

42. A system according to claim 41, wherein said laser comprises a pulsed laser.

43. A laser according to claim 41, wherein said laser comprises a continuous wave laser.

44. A system according to claim 41, wherein said marking mechanism includes a beam forming device for conditioning a beam generated from said laser to have selected characteristics.

45. A system according to claim 44, wherein said beam forming device includes an attenuator for controlling a characteristic representative of the power of said beam.

46. A system according to claim 44, wherein said beam forming device includes means for controlling a characteristic representative of the pointing of said beam.

47. A system according to claim 44, wherein said beam forming device includes a control system for providing close-loop control over a characteristic representative of the power of said laser beam.

48. A system according to claim 44, wherein said beam forming device includes a control system for providing close-loop control over a characteristic representative of the pointing of said laser beam.

49. A system according to claim 44, wherein said marking mechanism includes a pattern generator for forming said conditioned beam into a predetermined waveform comprising an array of beams.

50. A system according to claim 49, wherein said pattern generator includes a diffractive optical element comprising a one-dimensional Fourier array element having a continuous phase profile for splitting each incident beam into multiple beams.

51. A system according to claim 49, wherein said pattern generator includes a first and a second diffractive optical element for forming said conditioned beam into a predetermined waveform comprising a matrix of beams.

52. A system according to claim 49, wherein said pattern generator includes means for forming controlling pitch between beams in said matrix of beams.

53. A system according to claim 25, further including means for generating an intermittent servo track having variable spatial frequency.

54. A system according to claim 25, including means for controlling the size of said servo track marked on said magnetic tape.

55. An adaptor board capable of being integrated into a system for manufacturing magnetic tape, comprising

a roller assembly for carrying magnetic tape through a work area, and

a cutting mechanism for inscribing a servo track onto said magnetic tape, said cutting mechanism including

a laser for projecting a laser beam along an optical path,

a beam forming device disposed within said optical path and capable of controlling characteristics of said laser beam to form a conditioned beam having a selected beam size and power, and

a pattern generator for forming said conditioned laser beam into a predetermined waveform, and for projecting said predetermined waveform into said work area for forming said servo track on said magnetic tape.

56. A method or manufacturing a magnetic tape, comprising

providing a spool of magnetic tape, said magnetic tape having a recording side and a non-recording side,

unwinding the spool to pass at least a portion of the magnetic tape through a work area,

marking said portion of the magnetic tape as said tape passes through the work area to form on said non-recording side a servo pattern.

57. A magnetic tape having a servo track thereon, and formed by a process comprising the steps of

passing a portion of the magnetic tape through a work area,

directing a laser beam at said portion of magnetic tape as it passes through the work area, and

operating said laser beam to mark said portion of the magnetic tape to form an optically detectable servo pattern thereon.